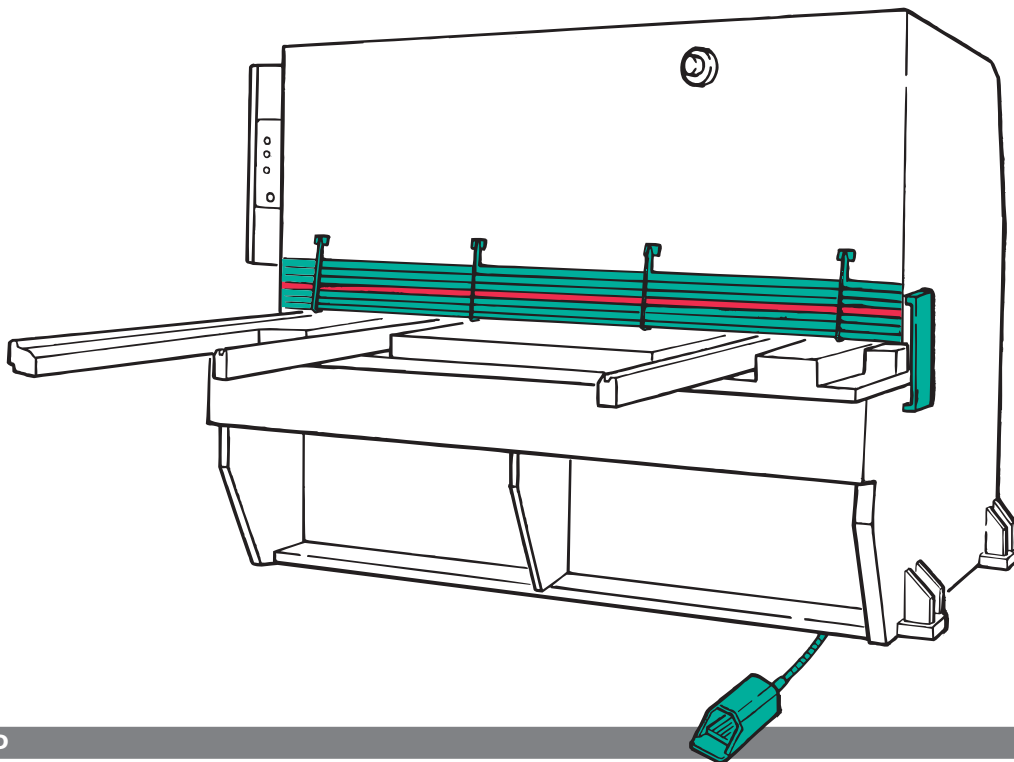


2.4.9 Guillotine

Legislative Decree 81/08 App. V and VI, Presidential Decree 459/96 App. I, UNI EN 13985:2005



HAZARD

PROTECTION

Machine made up one fixed and one moving blade for cold-cutting sheet metal

2.4.9.1 HAZARDS

Crushing or shearing due to the hold-downs and cutting blade being reachable from the front of the machine

- a) For mechanical-clutch mechanical guillotines, friction-clutch mechanical guillotines and hydraulic guillotines, the hold-downs and blade must be protected by a fixed guard. This guard must prevent access to the machining area (hold-downs, cutting line) during hazardous movement and, at the same time, give adequate visibility of the cutting line.
- b) For friction-clutch guillotines or hydraulic guillotines, the following can be installed instead of a fixed guard:
 - A movable interlocked guard. This guard (see [“Movable guards” in 2.2.3.2](#)) must prevent access to the machining area (hold-downs, cutting line) during hazardous movement. Opening the movable interlocked guard (see [“Movable guards” in 2.2.3.2](#)) should cause the machine to stop immediately; closing it should not start it immediately.
 - Optical barriers. This immaterial “guard” placed in front of the hazardous area creates a protected area. Crossing the barrier during machining should cause the machine to stop immediately; releasing it should not start it immediately.

2.4.9.1A FRONT OF MACHINE: FIXED GUARD

The fixed guard (see “Fixed guards” in 2.2.3.2) placed in front of the machine protecting the shearing area must offer good visibility of the cutting line. The height of the feed opening must be related to the distance from the nearest hazardous point (hold-down) as shown in the figure below.

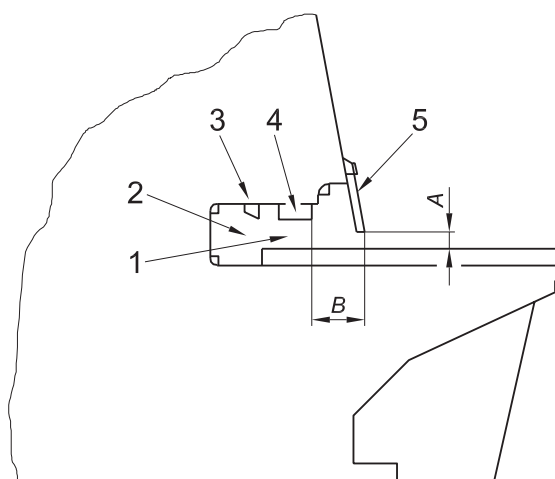
HEIGHT OF MATERIAL FEED OPENINGS AND CORRESPONDING MINIMUM SAFETY DISTANCES

A - Height of feed opening (mm)	B - Corresponding minimum safety distance (mm)
$A \leq 6$	0
$6 < A \leq 7$	15
$7 < A \leq 8$	20
$8 < A \leq 10$	40
$10 < A \leq 12$	65
$12 < A \leq 16$	90
$16 < A \leq 20$	120
$20 < A \leq 22$	165
$22 < A \leq 32$	190
$32 < A \leq 35$	230
$35 < A \leq 38$	320
$38 < A \leq 48$	400
$48 < A \leq 55$	450
$55 < A \leq 120$	850

FEED OPENING IN A FIXED GUARD ON THE FRONT OF A GUILLOTINE

Legend

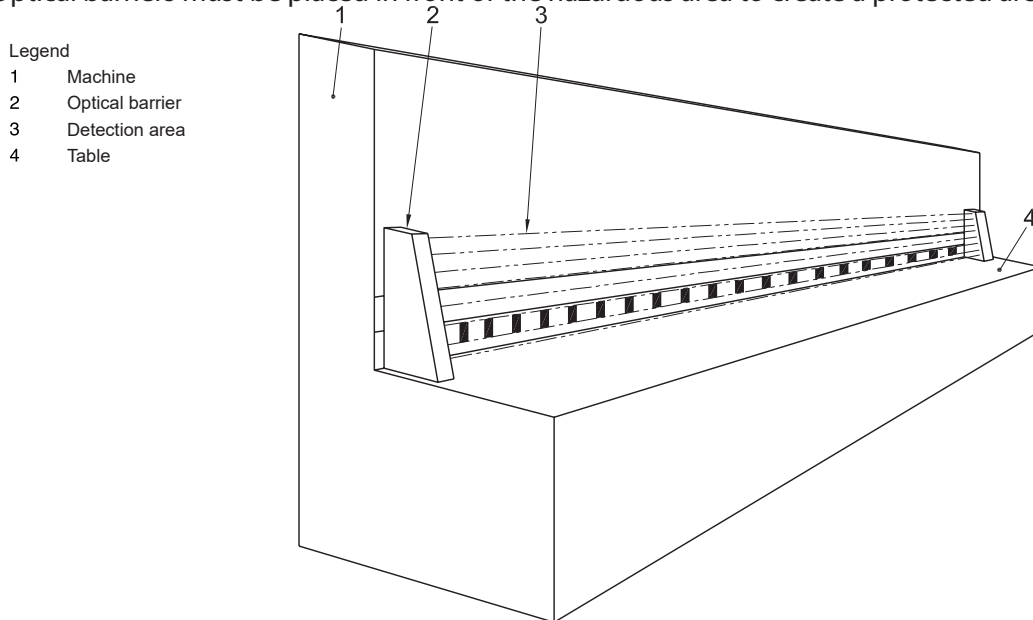
- 1 Crushing hazard
- 2 Shearing hazard
- 3 Moving blade
- 4 Hold-down
- 5 Fixed guard

**2.4.9.1B FRONT OF MACHINE: MOVABLE INTERLOCKED GUARD**

For friction-clutch guillotines: with this type of protection, the friction brake unit must have a double-body solenoid valve.

2.4.9.1C FRONT OF MACHINE: OPTICAL BARRIERS

Optical barriers must be placed in front of the hazardous area to create a protected area.



Access to the hazardous area must only be possible by crossing the optical barrier detection area. Additional protective devices should prevent access to the hazardous area from any other direction; the minimum safety distance for the optical barrier must be determined taking into account the machine's overall stopping times. The guillotine must be built in such a way that the feed table does not allow people to remain between the optical barrier and the hazardous area.

It must not be possible to start any hazardous movement while any part of the body is interrupting the optical barrier.

After a stop controlled by the optical barrier, the machine should be reset before being restarted. Reset devices should be positioned so that the hazardous area is clearly visible. There should not be more than one reset device for each detection area.

For friction-clutch guillotines: with this type of protection, the friction brake unit must have a double-body solenoid valve.

Crushing or shearing due to the hold-downs and cutting blade being reachable from the sides of the machine

The hold-downs and blade must be protected with a fixed guard (see "Fixed guards" in 2.2.3.2). This guard must prevent access to the machining area (hold-downs, cutting line) during hazardous movement.

Shearing, bruises and/or crushing due to contact with hazardous equipment reachable from the rear of the machine

The aforementioned hazards that are present at the rear of the machine must be protected using:

- a) Fixed guards (see "Fixed guards" in 2.2.3.2);

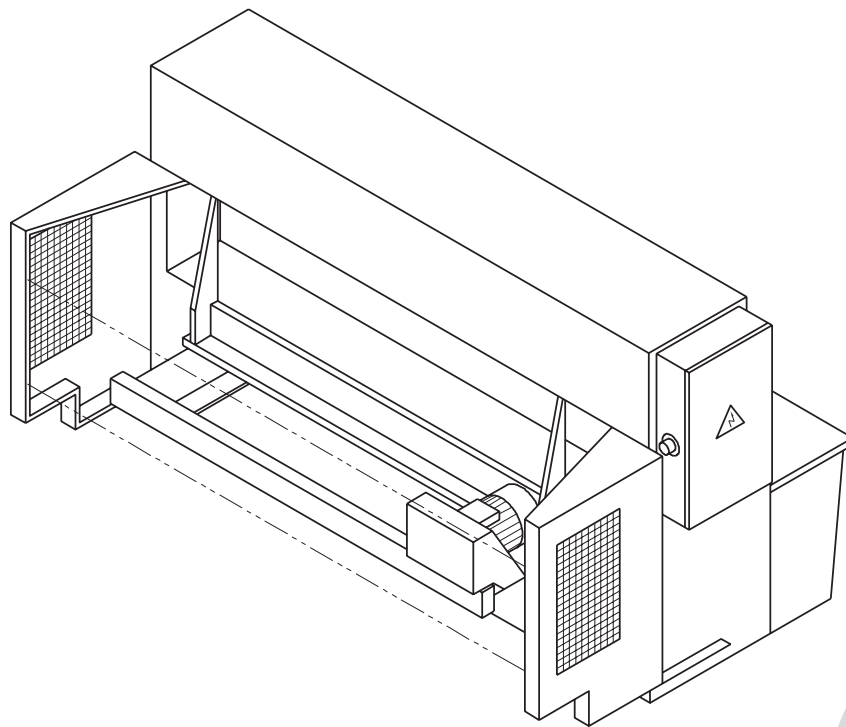
- b) Movable interlocked guards (see “Movable guards” in 2.2.3.2) on their own or with fixed guards. Opening the movable interlocked guard (see “Movable guards” in 2.2.3.2) should cause the machine to stop immediately; closing it should not start it immediately.
- c) Optical barriers. This immaterial “guard” placed at the rear of the machine should prevent hazardous equipment being reached during operation. Crossing this barrier should cause the machine to stop immediately; releasing it should not start it immediately.

2.4.9.1D REAR OF MACHINE: MOVABLE INTERLOCKED GUARD

The movable guards (see “Movable guards” in 2.2.3.2) should stop all hazardous movements in the opening phase. It should ensure that the blade, the motorised rear regulators and ancillary devices cannot be started until the guard is closed, i.e. the guard must be interlocked (see 2.2.5.1 “Interlock devices”). If a person’s whole body can go into the protected area, a separate reset control is required. The reset device must be placed outside the protected area and with a clear view of it.

2.4.9.1E REAR OF MACHINE: OPTICAL BARRIERS

Optical barriers: This system must be made up of at least two separate light beams placed at least 1200 mm from the nearest hazardous point. A reset device must be provided at the rear of the guillotine; the device must be placed outside the protected area and with a clear view of it.



Cutting or impact due to cut workpieces or swarf falling

To reduce the risk of injury from cut workpieces or swarf falling, there must be a slide, or other device with the same function, at the rear of the machine.

2.4.9.2 CONTROL EQUIPMENT

Starting

The only way to start the machine is to use specific control devices (see 2.2.6.1 “Starting”) that are easy to recognise and are protected against the risk of being accidentally activated (e.g. pushbuttons with guard ring, shrouded pedals, etc.).

Foot-pedal switches should be accessed from one direction only and with one foot. Free pedals should not be used.

Controls should be provided and used for adjustment, maintenance and lubrication.

2.4.9.2A CONTROLS TO USE FOR ADJUSTMENT, MAINTENANCE AND LUBRICATION

The movement of the blade, crossbeam and rear regulators during maintenance and lubrication adjustments must be possible with the guards and protective devices in position and operational. If this is not practicable, at least one of the following devices must be provided in the adjustment position:

- a) Hold-to-run control device (see 2.2.6.2 “Hold-to-run”);
- b) Jog device (see 2.2.6 “Control devices”);

If there is an injury hazard caused by the blade falling due to gravity during maintenance, a mechanical holding device should be installed.

Unexpected restart

Spontaneous restarts (see 2.3 “Machine electrical systems”) of the machine after power is restored must be prevented using a specific device.

Stopping

The machine must have a control device (see 2.2.6.3 “Stopping”) to stop it safely.

Emergency stop

All machines must have at least one emergency stop device (see 2.2.6.4 “Emergency stop”) placed within easy reach of the operator. If necessary, there should be more than one emergency stop based on the size and/or structure of the machine and the number of different possible workstations.

2.4.9.3 ERGONOMICS

Positioning

The machine must be installed so that there is free access to the work area even when setting, loading and unloading devices, etc. are being used (for example, lifting devices).

2.4.9.4 OCCUPATIONAL HEALTH AND SAFETY

Noise

Find out the noise levels to which staff are exposed when using the machine and follow the employer’s instructions.

2.4.9.5 PERSONAL PROTECTIVE EQUIPMENT

The machining work must be assessed carefully so that the use of PPE can be defined:



Gloves (see 5.6.4 “Gloves giving protection from mechanical risks”) protecting against mechanical risks and which are waterproof when cutting fluid is used.



Safety shoes (see 5.7 “Foot protection”) with protective toe cap (S1).



Hearing protectors (see 5.3 “Hearing protection”).

2.4.9.6 OPERATING INSTRUCTIONS

The machine must come with a manual, in Italian, explaining correct use and maintenance, including a programme of periodic inspections.

2.4.9.7 OCCUPATIONAL HEALTH AND SAFETY ACTIONS

Before use

- Read the Operating Instructions and be trained on using the machine safely.
- Check that the guards (see 2.2.3 “Guards”) and safety devices (see 2.2.5 “Safety devices”) are present and positioned correctly.
- Check that the guard interlock systems work (see 2.2.5.1 “Interlock systems”).
- Check that the emergency stop button works (see 2.2.6.4 “Emergency stop”).
- Adjust the front supports along the bed in accordance with the sheet metal size.
- Check that the front guard (fixed or movable) is not damaged (it should allow hands to reach the hold-downs and blades). If necessary, report any damage and start work only after it has been repaired.
- Adjust and set up the rear references only from the rear of the guillotine (do not put hands between the blades).
- Check that the selectors (operating mode, control) do not have keys in them (they must be kept by a supervisor).
- Do not start work if keys are still in the control panel selector (they must be kept by a supervisor).
- Position the soundproofing devices provided with the machine correctly. These include: sound insulation screens, workpiece unloading systems, noise-deadening mats.
- Wear the PPE indicated in this data sheet.

During use

- All interventions involving putting hands between the blades are forbidden (even with the guillotine switched off).
- In the loading phase, never put your hands between the sheet metal and the loading bench.

- Activate the cutting control only after putting the sheet metal in the correct position.
- Report any malfunctions or faults promptly to the supervisor.

Remove the cut workpieces from the noise-deadening mat (to reduce the noise).

After use

- Switch off the machine.
- Leave the area around the machine clean and tidy, especially the workstation and the workpiece unloading area.

